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A FLORA OF NEVADA. NO. 25.

HALORAGACEAE (HALORAGIDACEAE) OF NEVADA

by

F. R. FOSBERG

January 27, 1941

Issued by

The Division of Plant Exploration and Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture,
Washington, D. C.

Work Projects Administration of Nevada,
Projects, O. P. 65-2-04-13, W. P. 658;
O. P. 165-2-04-21, W. P. 752.

Collaborator

University of Nevada.

Address all queries concerning this publication to the Division
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THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

1925

RESEARCH REPORT NO. 10

1925

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HALORAGACEAE (HALORAGIDACEAE) OF NEVADA

By F. R. Fosberg

Plants of wet places or (in ours) truly aquatic, usually herbaceous; leaves alternate to verticillate, entire to pinnatifid, without stipules; flowers perfect or unisexual, 2 or 4 parted; calyx very small, 2-4 lobed, or entire; petals small, 2-4 or none, separate; stamens 1-8; ovary inferior, 1-4 celled, with 1-4 styles, ovules 1 in each cell, attached apically; fruit a small nut or drupe, or breaking into 4 one-seeded nutlets.

The family name is sometimes incorrectly spelled Halorrhagaceae or Halorrhagidaceae.

Two genera of aquatics found in Nevada. They may be separated by the following key:

- Submerged leaves entire - - - - - 1. Hippuris.
 Submerged leaves finely pinnatifid - - - - - 2. Myriophyllum.

1. HIPPURIS L.

HIPPURIS L. Gen. Pl. ed. 5: 4. 1754.

Herbs with the upper parts often extending above the surface of the water; leaves linear, entire, whorled; flowers axillary, sessile, with calyx reduced, petals absent, ovary one-celled, style one; fruit a one-seeded nut.

1. HIPPURIS VULGARIS L. Sp. Pl, 4. 1753.

Stem simple; leaves in whorls of 6-16, up to 4 cm. long, those on the emersed portion of plant somewhat reduced, bearing flowers in their axils.

Commonly called marestail.

Nevada: Washoe, Lyon, Lander, and Elko Counties, and in the Humboldt Valley "below Centerville" (acc. Watson).

2. MYRIOPHYLLUM L.

MYRIOPHYLLUM [Vaill.] L. Gen. Pl. ed, 5: 429, 1754.

Herbs, usually with the inflorescence extending above the surface of the water, leaves variously arranged, often the submerged ones finely dissected, those subtending the flowers reduced to bracts which are usually entire; flowers monoecious or polygamous, borne in spikes with the staminate uppermost; calyx with 4 lobes; petals 4 or none; stamens 4-8; ovary 4-celled, styles 4; fruit of 4 united or separating nutlets, these variously sculptured on the back.

A number of widely distributed species, almost impossible to distinguish when sterile. Only one known from Nevada.

1. MYRIOPHYLLUM SPICATUM L. var. EXALBESCENS (Fern.) Jepson, Man.

Pl. Calif. 691. 1925,

Myriophyllum exalbescens Fernald, Rhodora 21: 120. 1919.

Stem branched, with short internodes; leaves whorled,

1. HISTORICAL BACKGROUND

The historical background of the project is rooted in the early 20th century when the first attempts were made to understand the behavior of materials under stress. This was followed by the development of the theory of elasticity and the subsequent discovery of plasticity. The project aims to build upon these foundations by exploring the mechanisms of material failure and the role of microstructure in determining mechanical properties.

2. THE PROBLEM

The problem at hand is to determine the relationship between the macroscopic mechanical properties of a material and its microstructure. This involves understanding how the arrangement of atoms, grains, and defects at the microscopic level influences the overall strength, ductility, and fracture behavior of the material. The project will focus on the development of a theoretical model that can predict the mechanical response of a material based on its microstructural characteristics. This model will be validated through a series of experiments that involve the measurement of mechanical properties and the characterization of the microstructure using techniques such as X-ray diffraction and electron microscopy.

3. EXPERIMENTAL PROCEDURE

The experimental procedure involves the preparation of a series of samples with different microstructures. These samples will be subjected to a series of mechanical tests, including tensile, compression, and shear tests, to determine their mechanical properties. The microstructure of each sample will be characterized using X-ray diffraction and electron microscopy. The results of the experiments will be used to validate the theoretical model and to determine the relationship between the microstructure and the mechanical properties of the material.

finely pectinately pinnatifid; spike rather short, with whorls of flowers subtended by very small rhombic bracts, and smaller bractlets, pinkish, the flowers exceeding the bracts; stamens 8; fruit 2-3 mm. long.

The American milfoil, apparently rare in Nevada, referred by Tidestrom to M. spicatum L. and by Watson to M. verticillatum L.

Nevada: Washoe, Mineral, and Elko Counties.

